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Beaton

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(54) **EMERGENCY SHUT-OFF SYSTEM AND METHOD OF USING SAME**

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(51) **Int. Cl.**
G08B 23/00 (2006.01)

(52) **U.S. Cl.** **340/693.5**; 340/693.9; 340/693.11; 340/426.24; 340/464; 362/85; 362/95; 362/324

(58) **Field of Classification Search** 340/693.5, 340/693.9, 693.11, 426.24, 464; 362/95, 362/85, 234, 324
See application file for complete search history.

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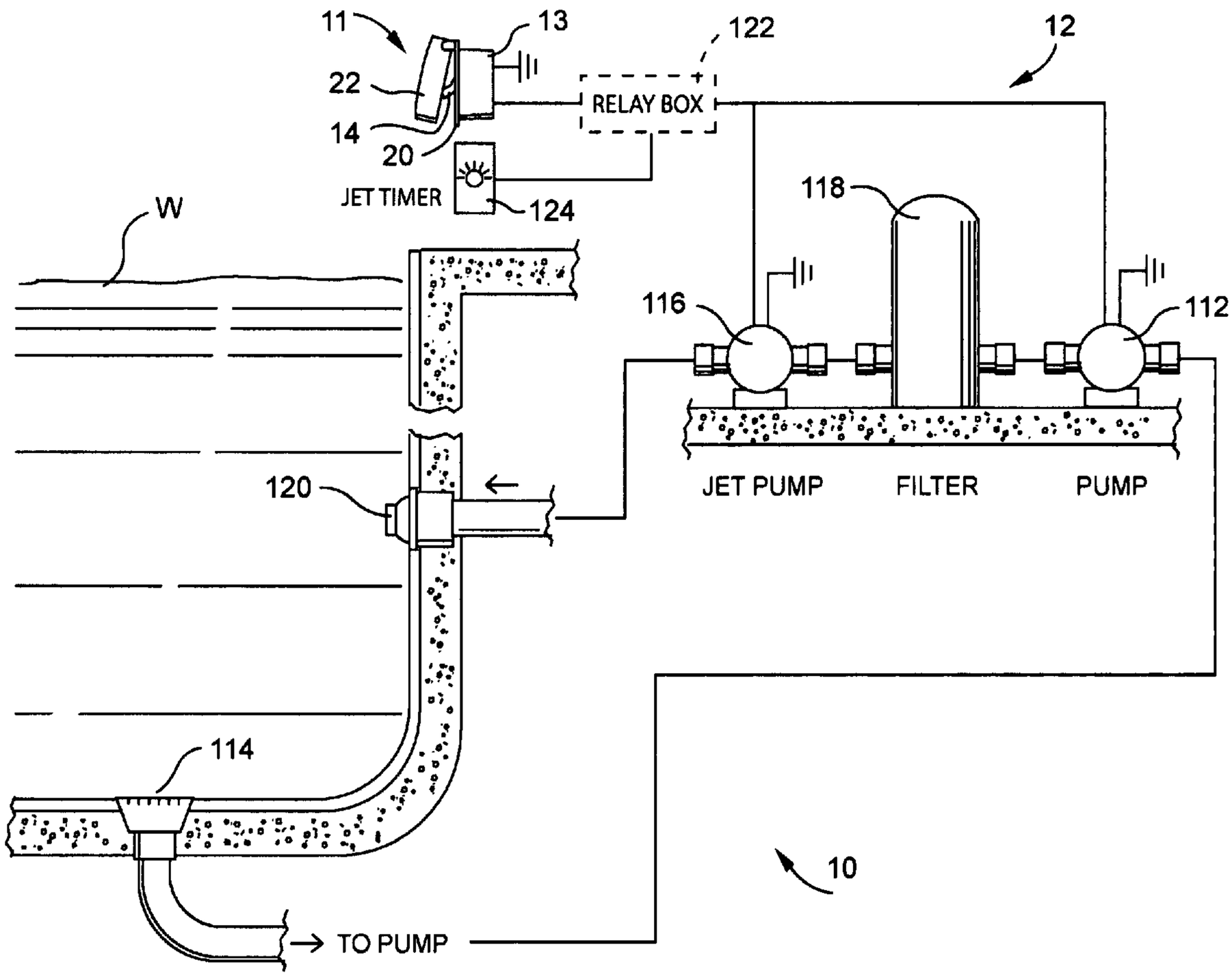
(57) **ABSTRACT**

An emergency shut-off system includes an emergency shut-off switch cover plate with a hinged cover that cooperates with a conventional emergency shut-off switch to help prevent the unintended shut-down of a pool or spa water pumping system. The emergency shut-off switch cover plate and hinged cover function in one mode of operation to prevent the unintended shutdown of the pumping system. In another mode of operation, the emergency shut-off cover plate and hinged cover provide a user with a immediate sensory indication that the pumping system is shut-down and needs to be re-activated. The sensory indication can be either a highly visual indication or in the alternative a combination of the highly visual indication with an audible sensory indication.

10 Claims, 6 Drawing Sheets



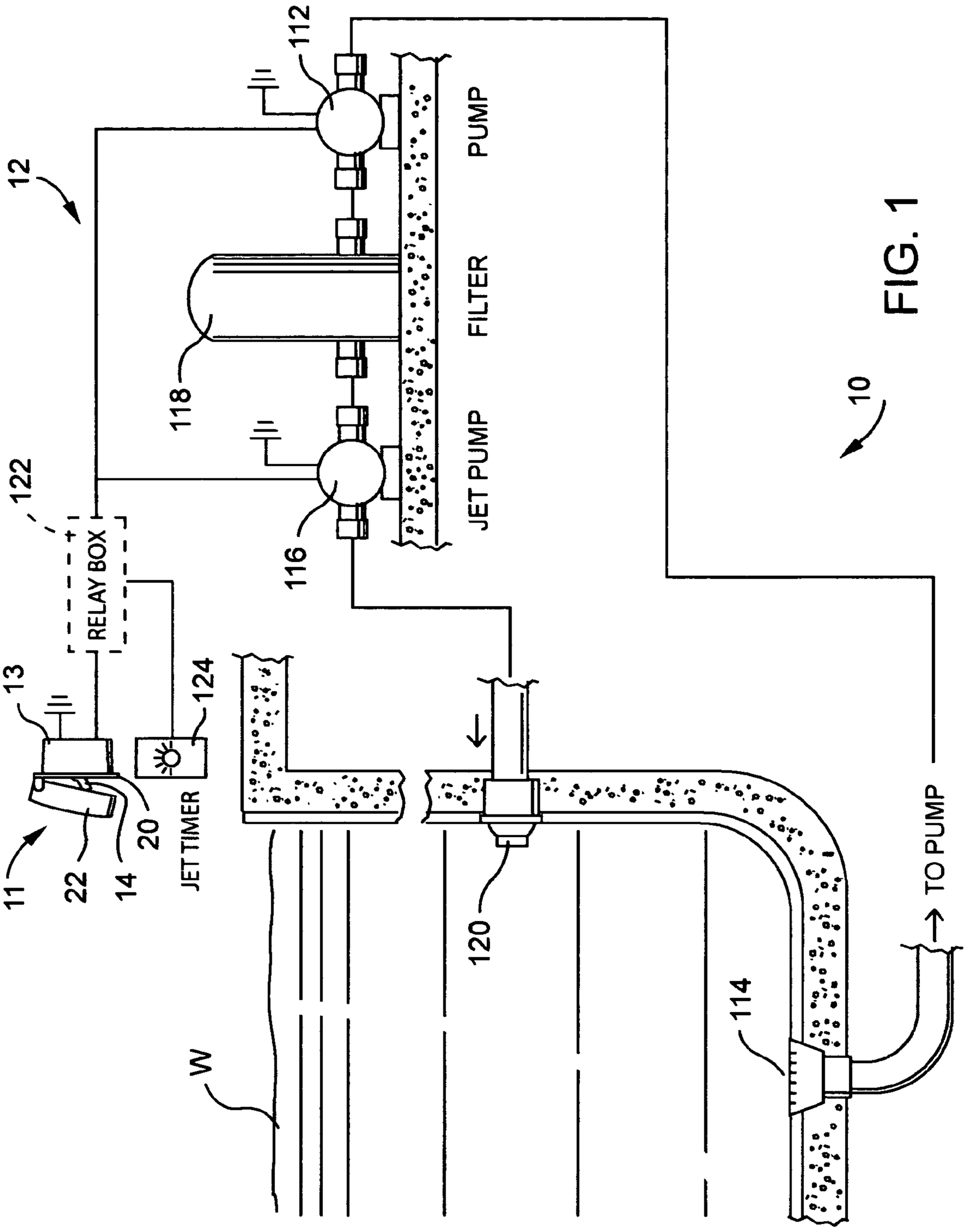

12
112
PUMP
FILTER
JET PUMP
118
116
122
RELAY BOX
13
124
JET TIMER
11
22
14
20
120
W
10
TO PUMP
114

FIG. 1

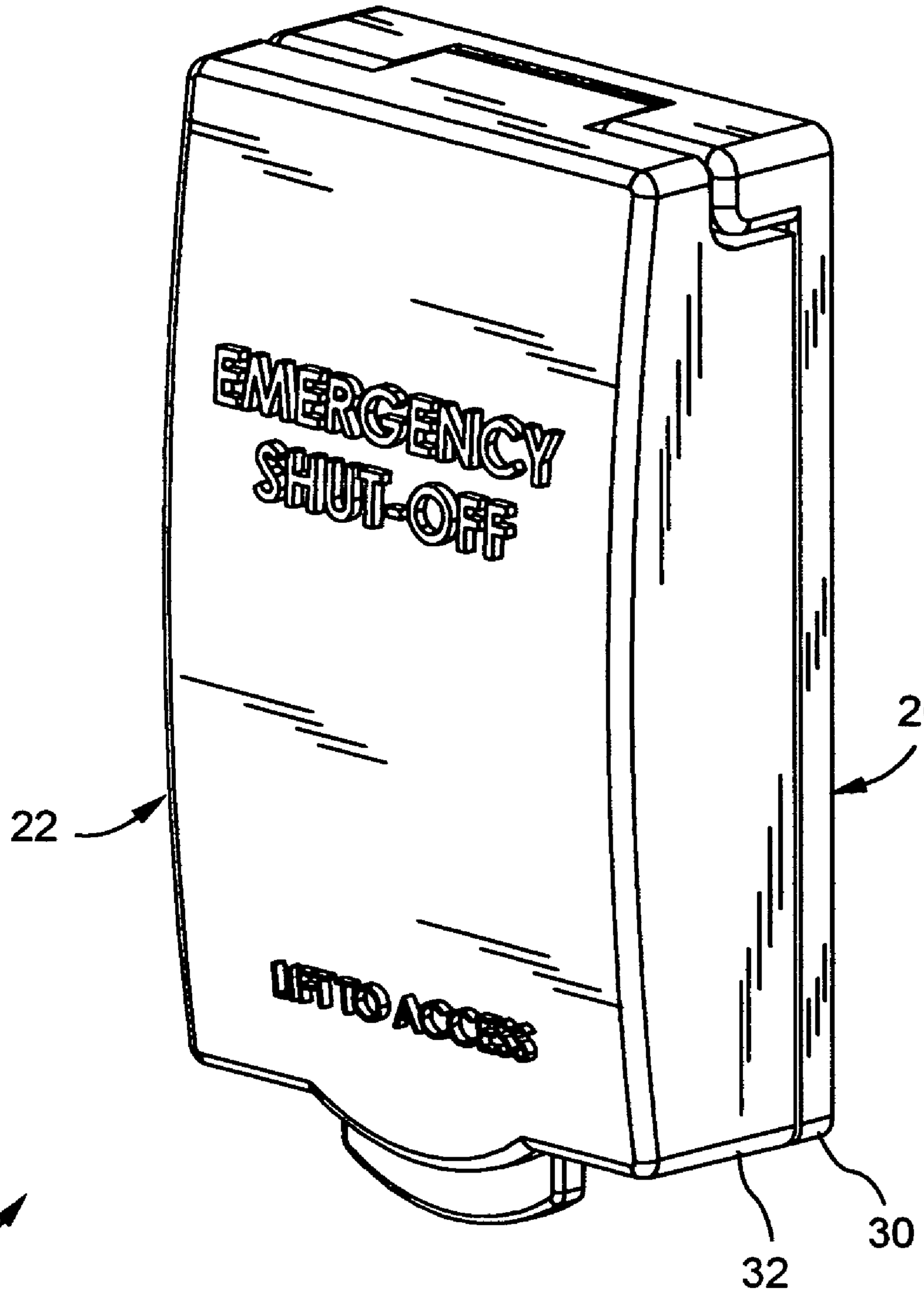


FIG. 2

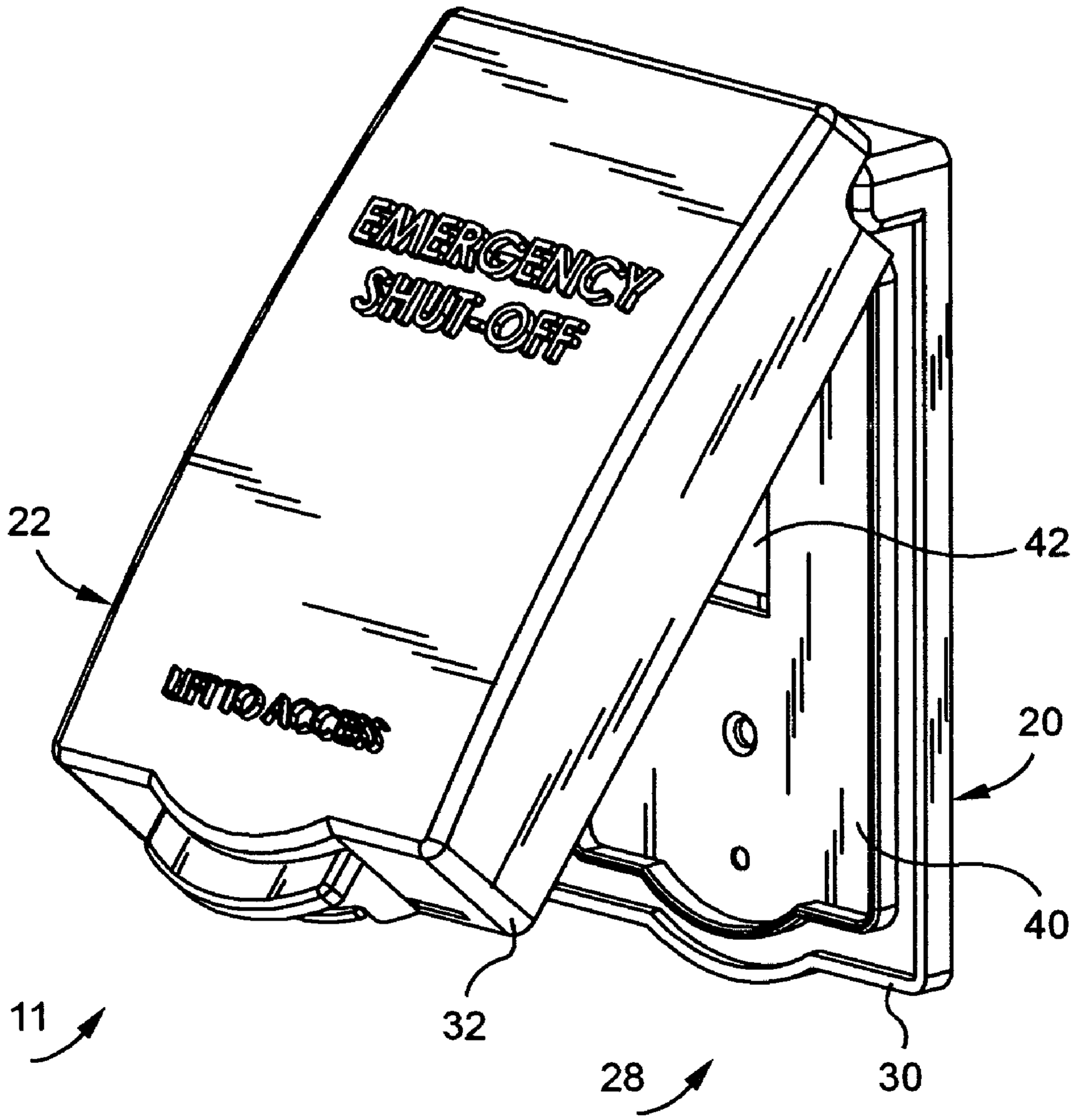


FIG. 3

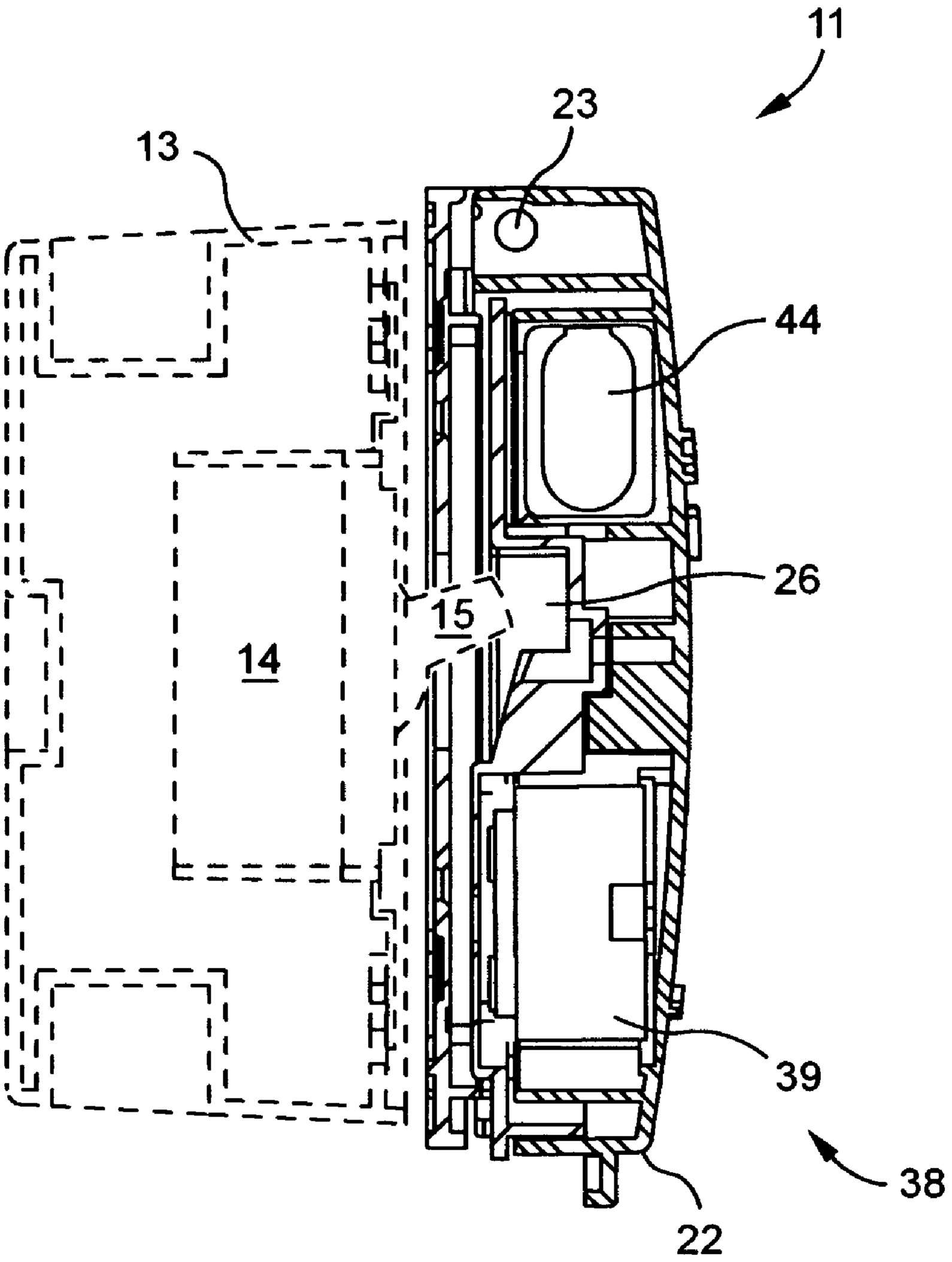


FIG. 4

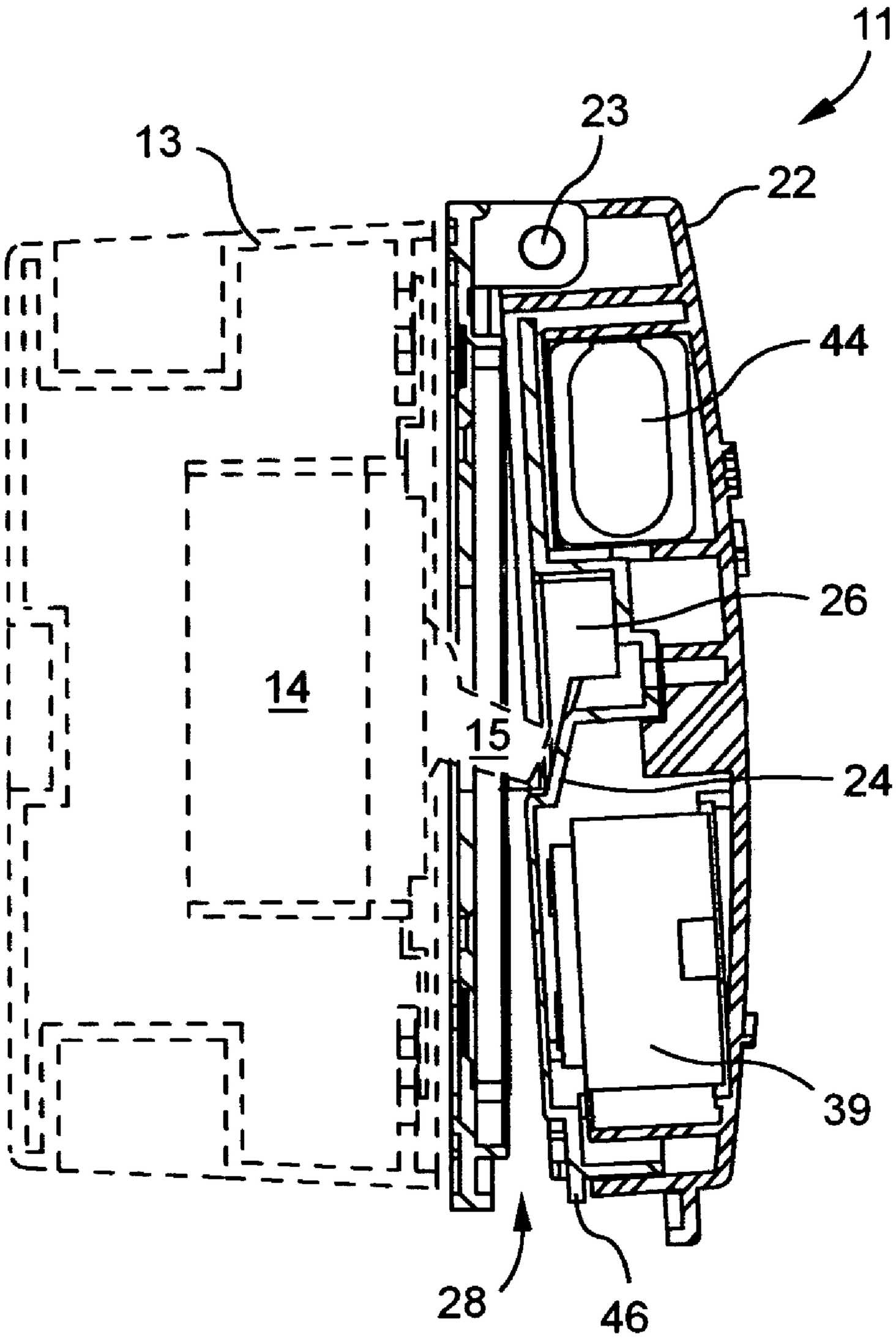


FIG. 5

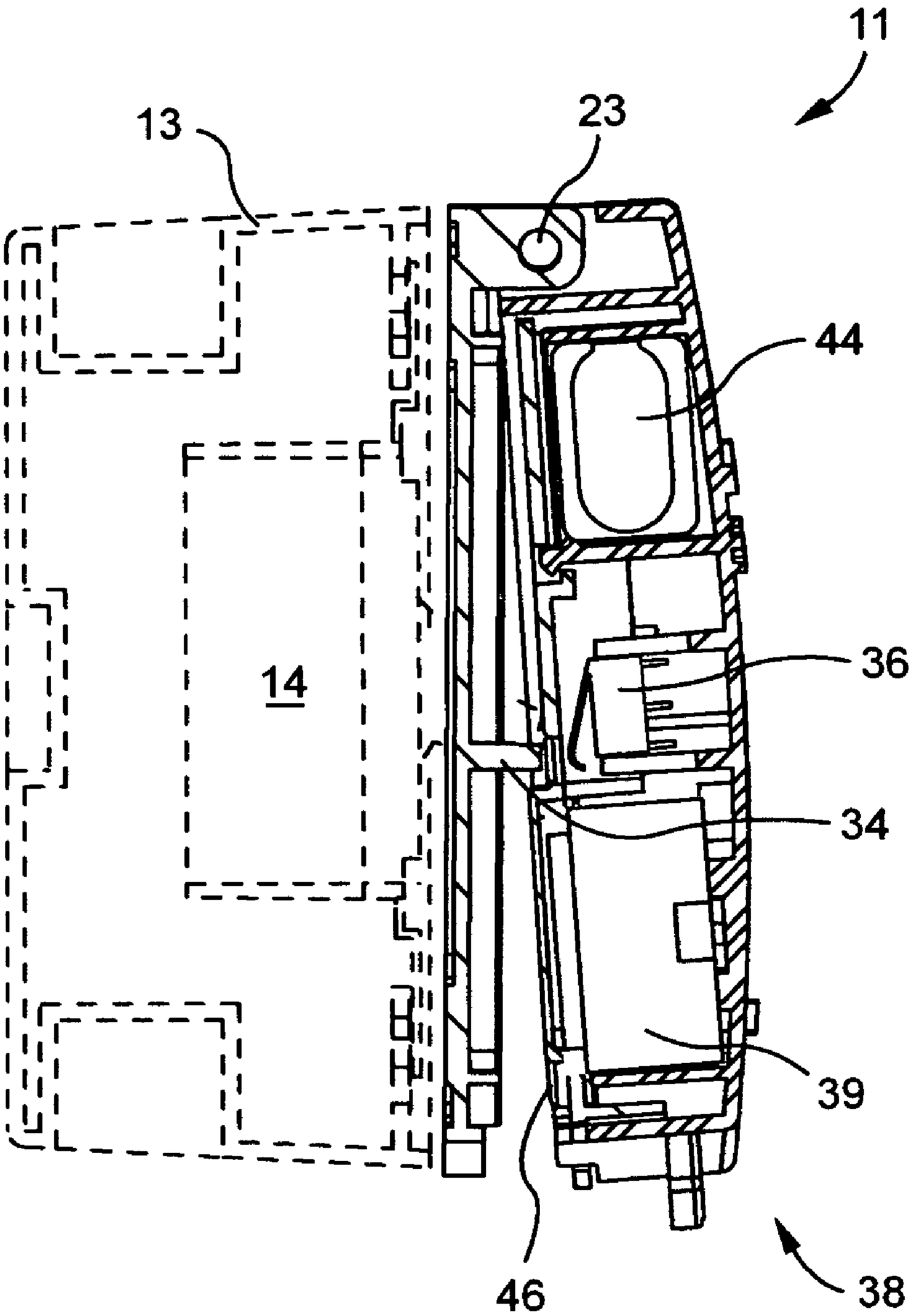


FIG. 6

EMERGENCY SHUT-OFF SYSTEM AND METHOD OF USING SAME

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[Not Applicable]

REFERENCE TO MICROFICHE APPENDIX

[Not Applicable]

CROSS-REFERENCE TO RELATED APPLICATIONS

[Not Applicable]

BACKGROUND OF THE INVENTION

1. Field of the Invention

This application relates to emergency shut-off systems and alarm indications, and more particularly to emergency shut-off system for a pool or spa pumping system and a sensory alarm provider for when the pumping systems is disabled.

2. Background of Prior Art

Emergency shut-off systems for pools and spas are well known in the prior art. However, there is a need for a new and improved emergency shut-off system that is not only low cost and convenient to use, but also which provides a user or maintenance person with an immediate indication that emergency shut-off system has been activated to place the system in a shutdown mode.

BRIEF SUMMARY OF THE INVENTION

In a preferred embodiment of the invention an emergency shut-off system includes an emergency shut-off switch cover plate, which cooperates with a conventional emergency shut-off switch and a hinged alarm box, to help prevent the unintended shut-down of a pool or spa water pumping system. The emergency shut-off switch cover plate and hinged alarm box function together in one mode of operation to prevent the unintended shutdown of the pumping system. In another mode of operation, when there is an emergency, they function together to provide a user with immediate assistance in locating where the emergency shutdown switch is located. In this same mode of operation, the person responding to the emergency, is required to raise the hinged alarm box away from the bottom portion of the emergency shut-off cover plate in order to activate the emergency shut-off switch. Once the emergency shut-off switch is actuated the user releases the alarm box allowing it to fall under the force of a coil spring (not shown) to an alarm position to provide the user with an immediate sensory indication that pumping system is shut-down and needs to be re-activated when the emergency situation has been resolved. In this regard, the sensory indication can be either a highly visual indication or in the alternative a combination of the highly visual indication with an audible sensory indication.

BRIEF DESCRIPTION OF THE DRAWINGS

The above mentioned features and steps of the invention and the manner of attaining them will become apparent, and the invention itself will be best understood by reference to the following description of the embodiments of the invention in conjunction with the accompanying drawings wherein:

FIG. **1** is a diagrammatic view of an emergency shut-off system, which is constructed in accordance with the present invention;

FIG. **2** is a greatly enlarged perspective view of an emergency shut-off cover plate with hinged cover, which forms part of the emergency shut-off system of FIG. **1**;

FIG. **3** is another perspective view of the emergency shut-off cover plate with hinged cover of FIG. **2**, illustrating the hinged cover in a partially opened position;

FIGS. **4-5** are illustrative cross sectional views of the emergency shut-off cover plate with hinged cover of FIGS. **2-3** respectively;

FIG. **6** is an illustrative cross sectional view of the emergency shut-off cover plate with hinged cover showing an extension pin of the cover plate of FIG. **3**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Referring now to the drawings and more particularly to FIGS. **1-3**, there is illustrated an emergency shut-off system **10**, which is constructed in accordance with the present invention. In the preferred embodiment of the emergency shut-off system **10**, the emergency shut-off system **10** helps to prevent the unintended shut-down of a pool or spa water pumping system **12** and provides a pool or spa user or maintenance person with a sensory indication that the pumping system is shut-down and needs to be re-activated. The sensory indication can be either a highly visual indication or in the alternative a combination of the highly visual indication with an audible sensory indication as well.

As best seen in FIG. **1**, the emergency shut-off system **10** generally comprises a shut-off alarm box **11**, which is mounted to an existing or conventional electrical box **13** that forms part of the pumping system **12**. An emergency shut-off switch **14** is mounted within the electric box **13** and includes a finger-engagable member **15** which projects outwardly from the electrical box **13** for immediate access by a user (not shown).

The pumping system **12** is a conventional pool or spa pumping system having a pump **112** in fluid communication with the pool or spa water W through a water drain **114**. The pump **112** in turn, is in fluid communication with a jet pump **116** through a conventional water filter **118**. The jet pump **116** returns the water W to the pool or spa via a jet outlet **120**.

In order to control the operation of the pump **112** and jet pump **116** in a normal mode of operation, both the pump **112** and the jet pump **116** are coupled electrically to a relay box **122**. The relay box **122** is coupled between a jet timer **124**, which causes the jet pump **116** to be turned on, and turned off for predetermined periods of time, and the emergency shut-off switch **14**. In this manner, whenever an emergency situation develops, the emergency shut-off switch **14** may be actuated to cause the pumping system **12** to be immediately shutdown.

As the pool or spa pumping system **12** is conventional and well known to those skilled in the art, the pumping system **12** will not be described hereinafter in greater detail.

Considering now the emergency shut-off system **10** in greater detail with reference to FIGS. **1-6**, the emergency alarm box **11** generally includes an emergency shut-off switch cover plate **20** and a hinged switch cover or alarm box **22** that cooperate with the shut-off switch **14**, and more particularly with the finger engagable member **15**, to help prevent the unintended shut-down of the pool or spa water pumping system **12**. The emergency shut-off switch cover plate **20** and the hinged alarm box switch cover **22** function in a closed

position to prevent the unintended shut-down of the pumping system **12** by requiring a pool or spa user to place the hinged alarm box cover **22** in an open position in order to activate the emergency shut-off switch **14**. Once the emergency shut-off switch **14** has been actuated to its power-off position, the user may release the alarm box cover **23** to allow it fall under the force of a coil spring (not shown) back towards its normally closed position. In the regard, as the alarm box **23** comes to rest between its normally closed position and a fully opened position against the distal end of the finger engagable member **15**, the alarm box **11** provides the user with a sensory indication that pumping system **12** is shut-down and needs to be re-activated. As will be explained hereinafter in greater detail, the sensory indication can be either a highly visual indication or in the alternative a combination of the highly visual indication with an audible sensory indication.

As best seen in FIGS. **2-5**, the emergency alarm box cover **22** is pivotally mounted to the electric switch cover plate **20** by a hinge **23**. The emergency alarm box cover **22** is moveable between an open position to allow the actuation of the shut-off switch **14** via its associated finger-engagable member **15** and a closed position to prevent the actuation of the shut-off switch **14** via its associated finger-engagable member **15**.

To facilitate providing the user with a sensory indication of the state of the emergency shut-off switch **14**, the emergency alarm box cover **22** includes an obstruction wall **24** and a void space **26**. In this regard, the emergency shut-off switch **14** cooperates with the wall **24** and the space **26** to help facilitate sensory indications that can be easily and quickly perceived by the user. More particularly, the obstruction wall **24** engages the distal end of the finger-engagable member **15**, when the emergency shut-off switch **14** is actuated to the power off position and the alarm box cover **22** is resting under the force of the coil spring (not shown) at the alarm position generally indicated in FIGS. **3** and **5**. In the alarm position (FIG. **5**), the alarm box cover **22** is disposed between its fully open position and its fully closed position. The alarm position can be immediately perceived by a very noticeable gap **28** (FIG. **5**) that is created between a base portion **30** of the cover plate **20** and a base portion **32** of the alarm box **22**.

Conversely, when the emergency switch **14** is disposed in its normally power on position, the distal end of the finger engagable member **15** is disposed in the void space **26**, which in turn allows the alarm box cover **22** to return under the force of the coil spring (not shown) to a non-alarm or fully closed position, indicted in FIG. **2**. The non-alarm position, like the alarm position can be immediately perceived by the visual indication that the base portion **30** of the cover plate **20** and the base portion **32** of the alarm box **22** are immediately adjacent to one another.

Considering now the cover plate **20** in still greater detail, the cover plate **20** includes a front face or wall **40** having a centrally disposed opening **42**. The opening **42** is elongated and is dimensioned for receiving therein for friction free movement the finger engagable member **15** which is coupled mechanically to the emergency alarm switch **14** to cause it to be turned on and off.

In order to help facilitate providing the user or maintenance person with an auditory alarm indication that the emergency shut-off switch **14** is disposed in a power-off position, the cover plate **20** also includes an actuation pin **34** that extends perpendicularly outward from the wall **40**. As will be explained hereinafter in greater detail, the actuation pin **34** has a predetermined length to penetrate into the inner space of the alarm box cover **22** a sufficient distance to actuate a micro switch **36** which is mounted in the alarm box cover **22**. In this regard, when the pin **34** actuates the micro-switch **36** it causes an alarm system **38** also disposed within the alarm box cover **22** to be shut-off.

Considering now the alarm box cover **22** in greater detail with reference to FIGS. **3-6**, the alarm box cover **22** has an open box-like structure, which is generally rectangular. The alarm box cover **22**, has sufficient space within its open space area to receive therein the micro-switch **36**, the alarm system **38**. In this regard, the alarm system **38** generally includes an alarm speaker **39** and a battery **44** that provides power for the speaker **39**. A battery cover **46** helps to protect and hold the battery **44** within the cover **22**. The micro-switch **36** is mounted in position to be actuated by the cover plate pin **34** when the alarm box cover **22** is resting in its normally closed position. In this position, the power to the alarm system **38** is cutoff preventing the alarm speaker **39** from making an auditory sound.

Conversely, when the alarm box cover **22** is resting in the alarm position with the distal end of the emergency shut-off switch **14** finger engagable member **15** is in engagement with the obstruction wall **24**, with the cover plate pin **34** disengaged from the micro-switch **36**. In this configuration power is supplied to the alarm system **38** so that an auditory sound is made by the alarm speaker **39** to provide the user or maintenance persons with an immediate indication that the pool pumping system **12** is in a shutdown or power-off condition.

Considering the alarm box **22** in still greater detail, the alarm box **11** is generally bright red in color and includes indicia to provide a user with an visual indication of the location of the emergency shut-off switch **14**. In this manner, a user can immediately located the emergency shut-off switch **14** in an emergency situation that would require the shutdown of the pumping system **12**.

In the preferred embodiment, the emergency shut-off system **10** has been described as having a battery-powered alarm. It should be understood however by those skilled in the art, that an electric power connection can be provided to the micro-switch **36** so that direct power may be provided to the alarm system **38** in lieu of battery power. It should also be understood by those skilled in the art that other sensory indictors may be provided. For example, a light emitting diode could flash on and off to provide a further visual indication that an alarm condition exists. Therefore, while a particular embodiment of the present invention has been disclosed, it is to be understood that various different modifications are possible and are contemplated within the true spirit and scope of the appended claims. There is no intention, therefore, of limitations to the exact abstract or disclosure herein presented.

I claim:

1. An emergency shut-off system, comprising:

an electric switch cover plate, said plate having an opening for receiving therethrough a finger-engagable shut-off switch;

an emergency alarm box movably mounted to said electric switch cover plate actuation movable to a closed position whereat said box is juxtaposed over said cover plate opening for covering and protecting said finger-engagable shut-off switch from accidental actuation to a power-off position, said emergency alarm box is further moveable between an open position to allow the actuation of said finger-engagable shut-off switch and said closed position to prevent the actuation of said finger-engagable shut-off switch; and

said emergency alarm box providing a sensory alarm indication to a user when said finger-engagable shut-off switch is actuated to said power-off position, or said

alarm box is moved away from said closed position, said emergency alarm box further including an obstruction wall and a void space.

2. The emergency shut-off system according to claim **1**, wherein said obstruction wall engages a distal end of said finger-engagable switch when said emergency shut-off switch is actuated to said power off position and said alarm box is resting under the force of a coil spring biasing said alarm box towards said closed position.

3. The emergency shut-off system according to claim **2**, wherein said finger-engagable switch is disposed in said void space when said emergency shut-off switch is actuated to a power on position and said alarm box is resting under the force of the coil spring in said closed position.

4. The emergency shut-off system according to claim **3**, wherein when said obstruction wall engages the distal end of said finger-engagable switch the user is provided with a visual indication that said finger-engagable switch is in a power-off condition.

5. The emergency shut-off system according to claim **4**, wherein when the distal end of said finger engagable switch is disposed within the void of said alarm box, the user is provided with a visual indication that said finger-engagable switch is in a power-on condition.

6. The emergency shut-off system according to claim **1**, wherein said emergency alarm box includes a switch actuated alarm and wherein said cover plate includes an alarm actuation pin;

said alarm actuation pin causing said switch actuated alarm to provide an auditory sound when said alarm box is disposed in an alarm position between a fully closed position and a fully open position.

7. The emergency shut-off system according to claim **1**, wherein said alarm box includes emergency indicia disposed thereon to provide a user with a visual indication of the location of said finger-engagable power switch in an emergency situation.

8. A method of providing a sensory indication of a pumping system operating condition, comprising the steps of:

providing an electric switch cover plate, said plate having an outwardly projecting actuation pin and an opening for receiving therein a finger-engagable shut-off switch; an emergency alarm box movably mounted to said electric switch cover plate for covering and protecting said finger-engagable shut-off switch from accidental actuation; said emergency alarm box having an obstruction wall for engaging said finger-engagable shut-off switch when it is disposed in a power off position and a void for receiving therein said actuation pin said finger-engagable shut-off switch when it is disposed in said power off position; and said emergency alarm box providing a sensory alarm indication to a user when said finger-engagable shut-off switch is actuated to a power-off position; and

moving said emergency alarm box away from said finger-engagable shut-off switch a sufficient distance to actuate said finger-engagable shut-off switch to shut down the pumping system; and

releasing said emergency alarm box to allow it to fall under the force of a spring and to come to rest in an alarm position disposed between said full opened position and a fully closed position, wherein said obstruction wall engages said finger-engagable shut-off switch and said actuation pin is disposed in said void to provide a user with a sensory alarm of a pumping system shut-down.

9. The method of providing a sensory indication of a pumping system operating condition according to claim **8** further comprising the steps of:

moving said emergency alarm box away from said finger-engagable shut-off switch a sufficient distance to actuate said finger-engagable shut-off switch to power-up the pumping system; and

releasing said emergency alarm box to allow it to fall under the force of said spring and to come to rest in a non-alarm position to provide a user with a sensory indication that the pumping system is operational.

10. The method of providing a sensory indication according to claim **9**, further comprising the steps of:

providing said alarm box with emergency indicia to provide a user with an visual indication of the location of said finger-engagable shut-off switch in an emergency situation that would require the shut-down of the pumping system.

* * * * *